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SPECA

GCSE Combined Science (AQA Trilogy) · Biology

Ecology · Mark Scheme

For use with the Worksheet. Marking points are indicative, not exhaustive: award equivalent correct answers.

1) A community is the populations of different species living and interacting in a habitat (1); a stable community is one where species and environmental factors are in balance, so population sizes stay fairly constant (1) [2]

2) Species rely on each other for things such as food, shelter, pollination, or seed dispersal (1); removing one species can affect the whole community (1); example, e.g. a plant relying on an insect for pollination (1) [3]

3) Any three of: light, space, water, soil minerals (plants); food, mates, territory (animals) (1 mark each, max 3) [3]

4) An organism adapted to survive extreme conditions, e.g. high temperature, pressure, or salt concentration (1); example, e.g. bacteria living at deep-sea vents (1) [2]

5) Abiotic, e.g. a fall in temperature could slow plant growth, reducing food availability (1) for the rest of the community (1); biotic, e.g. a new predator arriving could reduce prey numbers (1) [3]

6) A food chain starts with a producer (1), usually a green plant or alga that makes glucose by photosynthesis (1); this is followed by primary, secondary, and (sometimes) tertiary consumers, which feed on the organism before them in the chain (1) [3]

7) Quadrats (1); transects (1) [2]

8) 4 + 6 + 5 + 9 + 6 = 30 (1); 30 ÷ 5 = 6 (1); 6 daisies per quadrat, with correct units/working shown (1) [3]

9) It samples only a small representative area/proportion of the habitat (1), so the result is used to estimate the population across the whole area, not to count every individual (1) [2]

10) Carbon is returned to the atmosphere as carbon dioxide through respiration and decay (1); it is taken up again by plants during photosynthesis (1); microorganisms play a key role in decay, breaking down dead organisms and returning carbon dioxide and mineral ions to the soil and atmosphere (1) [3]

11) Biodiversity is the variety of species living in an ecosystem or on Earth (1); high biodiversity reduces how dependent any one species is on another, making the ecosystem more stable (1) [2]

12) Growing population and rising living standards increase resource use and waste (1); water pollution, e.g. sewage or fertiliser run-off (1); air pollution, e.g. smoke or acidic gases; land pollution, e.g. landfill or toxic chemicals (1) [3]

13) It destroys the peat-bog habitat directly, reducing the biodiversity that depends on it (1); it removes land available for other species (1); decaying or burning the extracted peat releases stored carbon dioxide, contributing to climate change (1) [3]

14) Any two reasons, e.g. land cleared for cattle or rice farming, or for growing biofuel crops (1 each, max 2); consequence, e.g. loss of habitat reduces biodiversity, or release of stored carbon dioxide contributes to global warming (1) [3]

15) Rising carbon dioxide and methane levels increase the greenhouse effect, trapping more heat in the atmosphere and raising global temperatures (1); this is described as global warming, one biological consequence being, e.g. changes to species' distribution or migration patterns, or habitat loss for cold-adapted species (2) [3]

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16) Any four of: breeding programmes for endangered species; protecting and regenerating rare habitats; reintroducing field margins/hedgerows in farmland; reducing deforestation and carbon dioxide emissions; recycling instead of using landfill (1 mark each, max 4) [4]

Total: 44 marks

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